Grid Status - PPDG / Magda / pacman

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ATLAS PPDG

❋ Existing Particle Physics Data Grid program newly funded (July 01) for 3 years at ~$3M/yr

❋ ATLAS support: 1.5 FTE BNL-Software, .5FTE BNL-Tier 1, 1FTE ANL (0.8 with ANL cost structure)
  ❑ Support at this level for three years

❋ T. Wenaus is the ATLAS lead, J. Schopf is the CS liaison for ATLAS

❋ Proposal emphasizes delivering useful capability to experiments (ATLAS, CMS, BaBar, D0, STAR, JLab) through close collaboration between experiments and CS
  ❑ Develop and deploy grid tools in vertically integrated services within the experiments

ATLAS PPDG Program

❋ Principal ATLAS Particle Physics Data Grid deliverables:
- **Year 1: Production distributed data service deployed to users.** Between CERN, BNL, and US grid testbed sites
- **Year 2:** Production distributed **job management service**
- **Year 3:** Create **'transparent' distributed processing** capability integrating distributed services into ATLAS software

❋ Year 1 plan draws on grid middleware development while delivering immediately useful capability to ATLAS
- Data management has received little attention in ATLAS up to now
- This is changing with the onset of Data Challenges, and the PPDG program is designed to help the DCs

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ATLAS PPDG Activity in Year 1

❋ Principal Project Activity: Production distributed data management (Magda/Globus)

❋ Other efforts:
- US ATLAS grid testbed -- Ed May et al
- Monitoring -- Dantong Yu, Jennifer Schopf co-chair WG
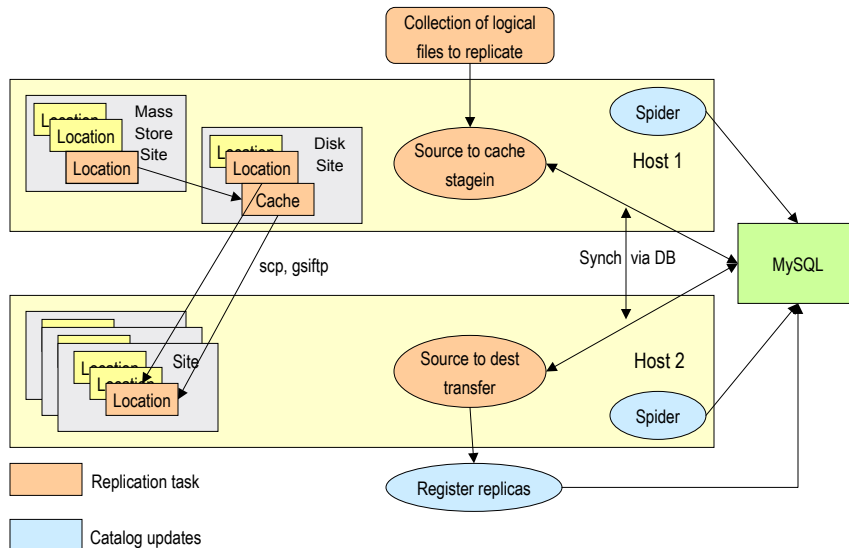- Distributed job management -- preparatory to year 2 focus
- Data signature

Magda

❊ **MAnager for Grid-based DAta**

❊ **Focused on the principal PPDG year 1 deliverable**

❊ **Designed for rapid development of components to support users quickly, with components later replaced by Grid Toolkit elements**

❑ **Deploy as an evolving production tool and as a testing ground for Grid Toolkits**

❊ **Under development at BNL**

Info: **http://www.usatlas.bnl.gov/magda/info**

The system: http://www.usatlas.bnl.gov/magda/dyShowMain.pl

Architecture Diagram

Collection of logical files to replicate

Mass Store Site — Location, Location, Location

Disk Site — Location, Location, Cache

Source to cache stagein

Spider — Host 1

scp, gsiftp

Synch via DB

MySQL

Site — Location, Location, Location

Source to dest transfer

Host 2

Spider

Register replicas

Replication task

Catalog updates

Distributed Catalog and Metadata

❋ Based on MySQL database

❋ Catalog of ATLAS data at CERN, BNL (also ANL, LBNL)

  ❑ Supported data stores: CERN Castor, CERN stage, BNL HPSS (rftp service), disk, code repositories, …

  ❑ Current content: physics TDR data, test beam data, ntuples, …
    ⌘ About 150k files currently cataloged representing >2TB data
    ⌘ Has run without problems with ~1.5M files cataloged

  ❑ Globus replica catalog to be integrated and evaluated

❋ Will integrate with external catalogs for application metadata

❋ Beginning: Integration as metadata layer into 'hybrid' (ROOT+RDBMS) implementation of ATLAS DB architecture

❋ To come: Data signature ('object histories'), object cataloging

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File Replication

❋ Supports multiple replication tools as needed and available

❋ Automated CERN-BNL replication

  ❑ CERN stage ⇒ cache ⇒ **scp** ⇒ cache ⇒ BNL HPSS

  ❑ *stagein*, *transfer*, *archive* scripts coordinated via database

❋ Recently extended to US ATLAS testbed using Globus gsiftp

  ❑ Currently supported testbed sites are ANL, LBNL, Boston U

  ❑ BNL HPSS ⇔ cache ⇔ **gsiftp** ⇔ testbed disk

  ❑ **gsiftp** not usable to CERN; no grid link until CA issues resolved

❋ GDMP (flat file version) will be integrated soon

  ❑ GDMP being developed by CMS, PPDG and EU DataGrid

Data Access and Production Support

❋ Command line tools usable in production jobs to access data
  ❑ getfile, releasefile, putfile

❋ Adaptation to support ATLAS Data Challenge production environment in progress
  ❑ Drawing on STAR production experience

❋ Callable APIs for catalog usage and update to come
  ❑ Collaboration with David Malon on Athena integration

❋ Near term focus -- application in DC0, DC1
  ❑ Accepted as the file cataloging and replication tool for DC0
  ❑ Objective is to integrate it with GDMP for ATLAS-wide use in DC1 also
    ⌘ Will at a minimum be used in the US in DC1

pacman

❋ Package manager for the grid in development by Saul Youssef (Boston U, GriPhyN/iVDGL)

❋ Single tool to easily manage installation and environment setup for the *long* list of ATLAS, grid and other software components needed to 'Grid-enable' a site
  ❑ fetch, install, configure, add to login environment, update

❋ Sits over top of (and is compatible with) the many software packaging approaches (rpm, tar.gz, etc.)

❋ Uses dependency hierarchy, so one command can drive the installation of a complete environment of many packages

Details addressed by pacman

❋ Where do I get the software?

❋ Which version is right for my system?

❋ Should I take the latest release or a more stable release?

❋ Are there dependent packages that I have to install first?

❋ Do I have to be root to do the installation?

❋ What is the exact procedure for building the installation?

❋ How do I setup whatever environment variables, paths, etc. once the software is installed?

❋ How can I set up the same environment on multiple machines?

❋ How can I find out when a new version comes out and when should I upgrade?

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pacman is distributed

❋ Packages organized into *caches* hosted at various sites, where responsible persons manage the local cache and individual *packages* hosted by that cache

❋ Support responsibility is distributed among sites according to where the maintainers are
  ❑ Many people share the pain

❋ Includes a web interface (for each cache) as well as command line tools

Test ATLAS Runtime Environment

- Caches in Use -

- Sample Pacman Cache
- Atlas Test Cache

- Local Packages -

Package	Description	Installed?	Update?	Depends on	Daemons	Date fetched
GDMP	Grid Data	-	-	-	-	Sun Aug 19 04:44:52 2001
Gaudi	Gaudi tarball	yes	-	-	-	Sun Aug 19 04:01:09 2001
Objectivity	Objectivity tarball	yes	-	-	-	Sun Aug 19 04:01:23 2001
OpenLDAP	Directory Access	-	-	-	slapd slurpd	Sun Aug 19 04:41:28 2001
Python-2.1.1	Python Compiler	yes	-	Python-2.1.1-docs	-	Sun Aug 19 04:02:46 2001
Python-2.1.1-docs	Python Documentation	yes	-	-	-	Sun Aug 19 04:02:39 2001
SRT	SRT tarball	yes	-	-	-	Sun Aug 19 04:01:31 2001
SSLeay	Encryption	yes	-	-	-	Sun Aug 19 04:41:28 2001
atlas_runtime	bins & libs	yes	-	Gaudi Objectivity lhcxx SRT atlas_sample_data	-	Sun Aug 19 04:01:54 2001
atlas_sample_data	Standard Atlas Packages	yes	-	-	-	Sun Aug 19 04:01:37 2001
globus-1.1.4	Grid Infrastructure	-	-	OpenLDAP SSLeay	-	Sun Aug 19 04:41:29 2001
lhcxx	lhcxx tarball	yes	-	-	-	Sun Aug 19 04:01:28 2001
nedit	Text Editor	yes	-	-	-	Sun Aug 19 04:02:30 2001

Installation as of Mon Aug 20 22:55:54 2001.

Pacman Home